DESCRIPTION

"CHILDPROOF AND ACCIDENT-PROOF ROTATING PERCUSSION HANDGUN"

Scope of the invention

The present invention relates to a firearm with various defence and safety mechanisms, which combines a high level of defence and effective protection by virtue of its unique characteristics with the advantage of providing greater safety, in order to go some way towards reducing the high firearms accident rate among adults and children.

Prior art

Some safety devices which can be adapted to various models of firearms are already known, as well as certain firearms that are built with a particular basic safety system in order to prevent them from being used incorrectly or inadvertently, thereby causing an accident.

Some safety devices satisfactorily fulfil their function, but they have certain inconveniences, namely the fact that once they are installed the firearm becomes useless as a means of defence, unless the key remains with it, which totally defeats the intended purpose. Firearms, which are designed to incorporate an additional safety system, for example a button, lever, catch or even the removal of the magazine in order to prevent accidental firing, have proven to be very ineffective as a means of preventing accidents.

Summary of the invention

The present invention does not propose to remove the risk of accidents caused by firearms, because this would be an impossible task, but rather to help substantially reduce the risk of accident, in order to reverse the growing trend of the increasingly high numbers of accidents recorded. For this purpose, a non-lethal personal defence system is presented, which has aggressive lines and design and at the same time is aesthetically pleasing, hardwearing, childproof and accident-proof.

This new firearm gives rise to a new classification in light weapons, the Rotating Percussion Handguns, to which this patent refers. It presents a whole range of attributes and characteristics, in particular the absence of a trigger (the most sensitive element common to all light weapons). The simple and obvious way in which a trigger is fired makes it the main factor responsible for the high rate of accidents among children and adults, as it can be inadvertently activated by anyone's hand, or rather finger, causing any conventional light calibre weapon to fire.

Rotating Percussion Handguns increase by more than twofold the level of effective protection against accidents by virtue of the fact that the trigger found in any light weapon is removed. In fact, it is not possible to activate this type of firearm using only one finger and it cannot even be fired with only one hand.

In the present invention, its original and unconventional method of firing means that in principle it will be difficult for someone who is not familiar with the system to use it. It is activated by rotating the handle and consequently the internal percussion mechanism in relation to the main static body, which requires the use of

two hands, one to rotate the handle in relation to the set of barrels and the other to hold the barrels in place in order to prevent them from rotating with the handle. This means that it is impossible to operate the firearm with only one hand, which contributes substantially to preventing accidents.

Another feature of the safety system is that the nominal diameter of the handle that activates the firing mechanism is slightly enlarged, so that the normal-sized hand of a four or five-year old child would not be able to grip the diameter of the handle and operate the firing mechanism, thereby causing an accident. At the same time, the strength that is required to activate the percussion system can be adjusted and calculated so that a small child would not be able activate it.

The mechanical safety device that locks the firearm and prevents it from being fired is in itself another fundamental feature of the present invention. In all similar low-calibre weapons the "on/off" safety systems use catch, lever or button mechanisms which, when they are unlocked, leave the firing mechanism cocked and ready to fire as soon as the trigger is touched with a single movement, thus making it extremely easy for the gun to be fired accidentally.

In the case of the present invention, in spite of its simplicity, a system is designed wherein it is necessary to rotate the safety wheel several times around the locking pin in order to move it vertically upwards or downwards, this being the only way of unlocking or locking the firing mechanism. Thus, various rotating movements of the safety wheel are required in order for the firing mechanism to be activated and not simply a single movement, as is normally the case with light weapons. The system can

also be locked by manually tightening it, which prevents a child from unlocking it.

Another characteristic of the firearm of the present invention is that it does not have the unstable hammer (though this in itself is not a novel feature), which also causes so many accidents when firearms are banged against an obstacle accidentally or during play or are carelessly dropped, thus causing them to detonate.

We have opted for a cartridge as the ideal ammunition for this purpose, in order to provide the user with a greater level of protection, since a weapon that fires a large number of projectiles covering a certain area is more efficient than one that fires a single projectile at the same area. This feature, which is intrinsic to the use of a cartridge as the chosen ammunition, will increase the likelihood of the target being hit by at least some of the projectiles even if the weapon is fired from a greater distance. The ammunition chosen is also the lowest calibre cartridge available on the market, since it has a very low kinetic energy load due to the small size of the lead projectiles and the fact that the propelling load is low, which will safeguard the physical integrity of a possible assailant, by wounding but not killing, unless the gun is fired at point-blank range and a vital organ is hit. This will avoid complicated legal problems and remorse felt for taking someone's life, even if it were a case of legitimate self-defence.

Another important feature is that this gun can be fired inside a pressurised aircraft in transit in any atmospheric plane, as its projectile load does not have enough kinetic energy to break a window or even to penetrate the considerable thickness of the various different layers of fuselage material and therefore depressurise the interior, meaning that this firearm can be

used as an excellent weapon of defence in the fight against air terrorism in commercial aircraft in the cockpit and control cabin, which are areas that are restricted to the crew.

However, in other cases, it can also be adapted by making the necessary alterations, in order to fire ammunition of any type and calibre.

The new type of laser sight used in this handgun, is also object of this patent, and was projected to be used with weapons that fire shot shell type ammunition, and is designated as Progressive Impact Area Indicator -P.I.A.I., it makes possible to accurately choose the area of the target to be hit, by enlarging or reducing the area of dispersion indicator, proportionally to the distance to the target, giving the user a precise notion of the aiming area, therefore avoiding unnecessary errors while at the same time the laser area indicator functions as a persuasive warning element.

Another important feature of the present invention is the simple design of the parts and mechanisms which constitute the Rotating Percussion Handgun, thus making it a reliable and relatively economical weapon with low production costs and minimum maintenance, consisting of a fairly small set of parts that are easy to produce on an industrial scale.

The various essential parts mentioned in this description and the drawings can be used individually or together in any combination with other elements having different characteristics and uses. It may therefore be understood that this invention is not restricted to the elements and characteristics described and illustrated herein and that other variations can be included in the spirit of the invention. This applies to the firing

mechanism incorporated into the handle, the ejection mechanism, the rotating safety locking and tightening system, the laser sight which functions accordingly to distance, the R.D.W.S. middle weapon bayonet system, the detachable handle, the variable number of barrels and the possibility of detaching them.

Use and performance

Childproof and accident-proof non-lethal, short-range, small-calibre household defence system, designed to provide users with greater effective protection, while at the same time offering a high level of safety when the firearm is handled, thus giving it four intended uses:

- as a firearm able to fire four consecutive cartridges, comprising eight rounds of ammunition, four in the chambers and four more in a special container inside the handle;
- as a self-defence baton in possible body combat, by virtue of its ergonomic format as well as its actual weight;
- as an optional extra means of defence, characterised by the use of a secondary defence system during the critical period of time when the ammunition runs out and the firearm is open and is being reloaded, this system being known as the "Reload Defence Weapon System" (R.D.W.S.), in the form of a middle weapon bayonet type built into and supported by the firing handle;
- by folding the handle in relation to the barrels on its hinge and opening it to a certain angle, will separate the firearm into two parts, i.e. the set of barrels which can be used as a smaller baton or throwing weapon and the handle with a built-in bayonet constituting a dagger, which serves as a very useful last resort weapon, in the event of a possible direct confrontation with one or more attackers.

Brief description of the drawings

The invention is described and explained hereunder with reference to the attached drawings, which represent a non-restricted embodiment. In the drawings:

- Figure 1 shows general views representing the whole of the firearm, with the grip closed, depicting a plan view (a), a side view (b), a view from below (c), a rear view (d) and a front view (e).

- Figure 2 shows a view from above representing the axis of the longitudinal cross-section C1-C1 with the grip closed; Figure 2a represents the longitudinal central cross-section of Figure 2.

- Figure 3 shows an aerial view of the detailed view C2, which represents the percussion and firing mechanism with the most important parts duly indicated and numbered.

- Figure 4 shows an exploded perspective view of all the component parts of the childproof and accident-proof Rotating Percussion Handgun, which are duly numbered and individually arranged.

- Figure 5 shows an exploded isometric perspective view of the various parts which constitute the present percussion and firing mechanism.

- Figure 6 shows isometric perspective views representing the safety locking system, in both the assembled 6(b) and exploded 6(a) versions, with the various elements numbered and individually arranged and also showing the optional bayonet system.

- Figure 7 shows isometric perspective views representing the semi-automatic cartridge ejection system, in both the

assembled 7(a) and exploded 7(b) versions, all the parts being numbered, and arranged according to their layout.

- Figure 8 shows various views representing the part (8) - ramps disc- depicted in elevation (a), in plan view (b), in a view from below (c), and in an auxiliary perspective view (d), and it also shows an auxiliary view of the set of guiding ramps (62), pre-firing points (63) and firing or resting points (61).

- Figure 9 shows various views representing the part (11) - striker guiding disc- depicted in elevation (a), in plan view (b), in a view from below (c), and in auxiliary perspective views from above (d) and from below (e).

- Figure 10 shows a perspective view of the firearm when opened and in the loaded position, with the optional R.D.W.S. system; Figure 10a shows a perspective view of the handle separated from the barrels with the firearm in the unloaded position, also depicting the bayonet element.

- Figure 11 show the demonstration of the integrated Progressive Impact Area Indicator laser sight.

Detailed description of the invention

As can be seen from the Figures, the firearm is generically represented in Figures 1 and 2. Figure 3, which illustrates the mechanical percussion and firing system (c) situated inside the rotating handle (B), shows in the resting position the striker (20) inserted by its ends and balanced between the return spring (25) and the compression spring (24) by means of the kinetically-supported cylindrical threaded adjustment block (21) for adjusting the impact force of the striker (20), which at the same

time adjusts the position of the striker in relation to the plane (P6) of the disc with projections (8) (Figure 8d).

The ramps disc (8) displays a set of guiding ramps (82) (Figure 8e) which, when the whole constituted by the firing handle (Figure 5) rotates, rest(s) inside the annular recess (81) (Figure 9e).

The return spring (25) is supported at one end inside a housing (52) in the plane (P1) (Figure 9e) of the guiding disc (11) of the striker (Figure 9d), with the other end resting on the plane (P3) (Figure 5) of the adjustment unit (21). The compression spring (24) rests on the plane (P4) of the adjustment unit (21), and is compressed in relation to the plane (P5) of the percussion assembly support ring (17) which supports the percussion assembly. The ring (17) functions as a housing for the rubber block (23) which damps the kinetic energy of the recoil resulting from the detonating gases, which is attached to the head of the screw (18) under a certain amount of pressure, being limited on the outside of its diameter by the inside of the resistant tube (26) of the handle.

The firing set (C) consists of the striker (20), adjustment block (21), return spring (25), compression spring (24), and it is surrounded by the transporting tube (22), which in turn is attached by means of an external thread to the threaded housing (52) (Figure 9e) in the striker guiding disc (11), which tube must have along its length a minimum clearance between the end (54) of the tube (22) and the plane (P5) of the percussion assembly support ring (17), in order to allow movement with a minimum amount of friction between the various parts that make up the mechanism.

The screw (18) acts as a central axis of the firing mechanism, around which the set comprising the striker (20), the support and adjustment block (21), the return spring (25), the compression spring (24), the transporting tube (22) and the striker guiding disc (11), rotates according to a translatory movement restricted by the planes of the ramps disc (8) and of the percussion assembly support ring (17), both of which are static.

The screw (18) also has its end (55) threaded inside the central threaded hole (56) (Figure 8d) of the ramps disc (8), being surrounded by the supporting tube (19) the purpose of which is to solidly attach the percussion assembly support ring (17), being the end of the tube (19) resting against the plane (P6) (Figure 8d) of the disc with projections (8), tightly and freely passing through the cylindrical hole (58) (Figure 9e) of the striker guiding disc (11).

The whole set of parts described above is inserted longitudinally inside the housing tube (26), the end (59) of which is solidly attached to the circular surface (60) of the striker guiding disc (11) by means of an appropriate screw or thread, the outer handle (50) being attached thereto by means of two screws (51), which are concentric and diametrically opposite, thus allowing the whole percussion assembly to rotate and thus cause the firing of a shot.

This rotating movement will release from its resting position the internal mechanism of the handle, which, when rotating movement is transmitted to it around its longitudinal axis, will force the firing set (Figure 5) consisting of the striker (20), adjustment block (21), return spring (25) and compression spring (24) inserted inside the transporting tube (22), coupled to the striker guiding disc (11) situated at a certain distance from the

central axis (52), to execute a translatory movement around the longitudinal axis of the handle.

In this way, the striker (20) is forced, from its resting point (61) (Figure 8d), to commence a firing cycle, starting by sliding along one of the various guiding ramps (62) which will transmit through the compression spring (24) - resting on the percussion assembly support ring (17) fixed to the head of the central screw (18) at a distance corresponding to the length of the tube (19) which houses the screw that supports the whole firing system - sufficient kinetic energy to the body of the striker (20), so that when the pre-firing point (63) is reached and the striker is released from the tension exerted in the compression spring (24), it will move forward with enough force to detonate the shell.

The firing cycle is completed when the striker returns to the resting point (61) coinciding with the starting point for another cycle.

The rotating safety locking and tightening system (Figure 6) is a mechanism designed to prevent the rotating movement of the rotating firing handle around its own axis, consequently activating the percussion system. Various rotating movements of the safety wheel (16) are required in order to lock or unlock the active safety system (D) using the force exerted by the tightening of the safety wheel (16). This wheel has a central threaded hole through which the rotationally static threaded safety pin (13) passes, limited to movement according to its vertical axis, moving up or down as the wheel (16), limited by its top and bottom planes, is manually rotated around its axis in one direction or in the opposite direction.

The wheel (16) and the pin (13) are both housed inside the part (15) that supports the system (Figure 6a),

which is attached by means of a screw (44) and an indentation (64) in the safety locking assembly (12), and at the same time is the vertical guide of the safety pin (13).

When rotating movement is transmitted to the system, the pin (13) totally recoils to the level of the top plane (P7) (Figure 6a) of its guiding part (15), corresponding to the activated safety position. The other end (66) locks the mechanism of the rotating firing handle when it is inserted inside one of four holes (67) (Figure 6) in the striker guiding disc (11) equal in number to the number of barrels.

When the safety wheel (16) is rotated in the opposite direction, the pin (13) rises, unlocking the locking system and releasing the rotating firing handle, while at the same time the top end (68) of the pin becomes visible in the form of a projection in relation to the top plane of the guiding part (15).

The opening and closing (Figure 6) of the firearm is achieved by means of a similar system, using the closing wheel (14) assembled inside the safety locking assembly (12), said wheel being restricted in its top and bottom planes and only having the rotating movement allowed by the safety pin (13) and by the wheel slot (83) of the part (12).

The firearm includes several barrels (3) (Figure 4), four in the case of the embodiment presented, though this number may vary according to the alterations made. The barrels are assembled longitudinally and are arranged parallel to each other, their ends (69) being solidly threaded or fitted into an appropriate housing (70) (Figure 7) inside the disc (2) which supports the barrels (Figure 4). In turn, this disc is joined to the outer frame (1) by

means of a thread, fitting together or screws (39), the barrels being fixed at their other end (71) by the barrel support disc (4) which attaches and supports the set (E) (Figure 2a) of barrels.

The barrels, when they are inserted into the holes (72) in the disc (4), bump against this disc at the point where they project outwards (73). The disc (4) has a central hole through which freely passes with a minimum clearance the screw (5) that fixes to the plane (P8) (Figure 8) the set of barrels (3), the outer frame (1) and the tube (45) that supports the ejection system to the plane (P9) (figure 7) of the supporting disc (2) in an appropriate threaded housing which does not extend beyond the limits of the plane (P10).

The whole formed by the firing barrels (3) and by the outer frame (1) can be separated (Figure 10) by means of its hinge (6-9) (Figures 4 and 10). This hinge has limited rotating movement within the whole, constituted by the rotating handle and the remaining elements, which can be removed by reducing the angle between them and the longitudinal axis of the handle. It has a recess (74) (Figures 6 and 10) in line with the transverse axis of the handle, causing the system to separate into two parts. One of these parts can be optionally fitted with an internal or external bayonet (10) (Figure 6), coupled to the middle weapon on top of the ramps disc (8).

The ejection system (Figure 7) comprises an ammunition holder disc (40) of a considerable thickness mounted on plane (P11) (Figure 7b) by means of four longitudinal parallel threaded shafts (41), which are inserted at one end into the guiding holes (75) existing for this purpose in the ammunition holder disc (40) and at the other end of the part (2).

The shafts (41) are coupled and attached by the set of screws (48) to the part (46) which supports the movement of the ejection system. The part (46) is in turn mounted on a longitudinal elastic system consisting of a spring (47) (Figures 4 and 7) supported at the appropriate point by the cylindrical projection (76) of the tube (45) (Figure 7).

This whole set of parts, with the exception of the ammunition holder disc (40) is housed inside the outer frame (1).

The foldaway grip (G, 31) (Figures 2 and 4), which has an ergonomic design, is fitted around the outer frame (1) when it is in the closed position. This grip can rotate and its rotating movement occurs around the axis (77) defined by the two lateral supports (77) (figure 4), which are screwed or fitted into two laterally opposite holes on the outer frame (1).

The grip, when it is in the open position, has four functions: as a grip during the act of firing, as an auxiliary sight (F) (Figure 2) for firing, as a vertical stabilising tripod and as a system for activating the laser. The laser system (Figure 11) is activated by pressing the spring button (35) (Figure 4), a service switch for the internal laser sight system which functions progressively according to distance, the grip (31) reaching at this point its maximum open position angle in relation to its own longitudinal axis. Under these conditions, the grip presses the switch button (35) (Figure 4) which is situated at the bottom of the tube (1), at a precise point, thereby activating the laser system.

The set of barrels (3) can be separated from the handle (Figure 10a) by reducing the angle of the set of barrels in relation to the longitudinal axis of the handle

by means of the hinge system. The parts comprising this hinge system are firmly coupled by means of welding and/or screwing to the set of barrels and to the ramps disc (8), on side A and side B respectively (Figure 10). One of the sides has a recess (74) (Figure 6a) and the other has a transverse shaft (79) (figure 10a), which are released due to the rotating action and thus allow the whole structure to separate.

Inside the handle, as well as the percussion mechanism, there is a container (80) (Figure 3) for carrying extra ammunition which is closed by means of a cover (30) (Figure 5).

Reference is also made to the existence of a sword-like hand protector attached to the handle, being either fixed or having rotational movement (not shown in the Figures), of a cord to be attached to the user's wrist coming from inside the handle through the central hole in the cover (30) and of a sight marker (7) (Figure 4) in the form of a hexagonal screw with a conical tip, threaded to the top exit end of the outer frame (1).

It is considered that no further details need to be added to this description in order for any person skilled in the art to understand the present invention and the advantages that it offers. The materials, shapes and dimensions and the layout of the components can be altered, provided that this does not modify the essence of the present embodiment. The contents of this specification should always be considered in their broadest and not restricted terms.